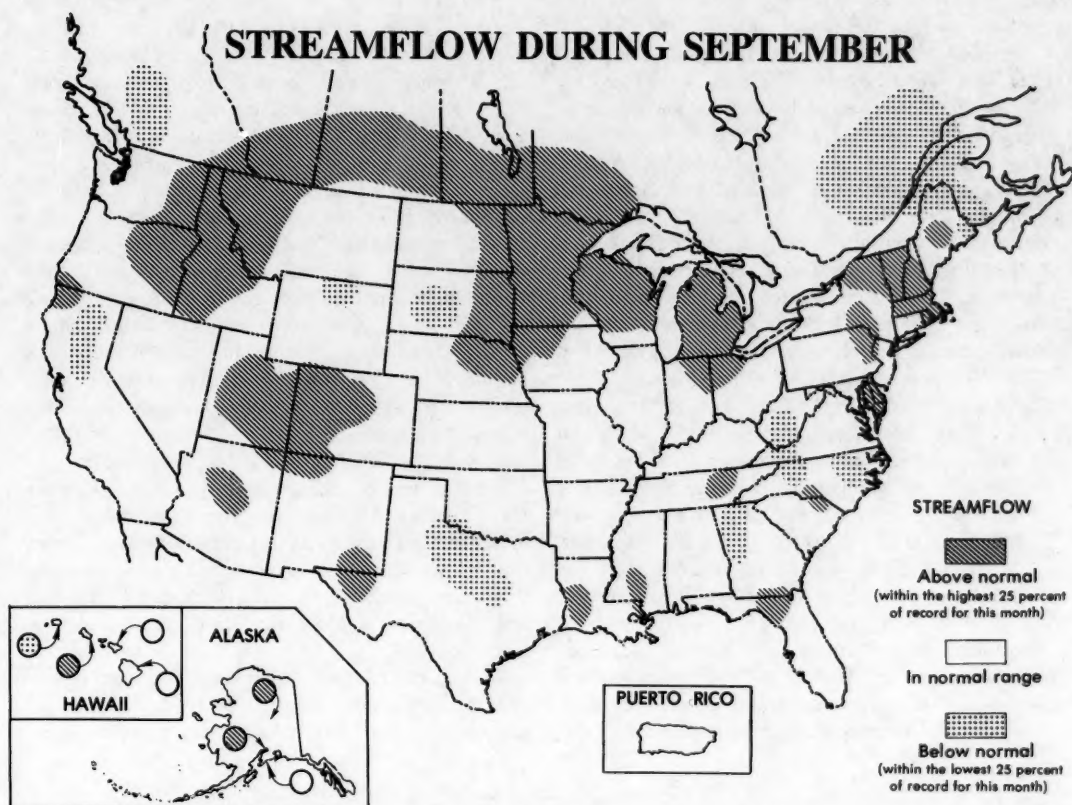


National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

SEPTEMBER 1985



Streamflow generally decreased in Hawaii, Alaska, southwestern Canada, North Dakota, Wyoming, Utah, Colorado, Illinois, Indiana, the Southeast, Quebec, and New Brunswick. Flows generally increased in the rest of the United States and Canada. Streamflow was in the normal range or above that range at 91 percent of the index stations.

Two hurricanes, Elena along the Gulf Coast August 30 to September 3, and Gloria along the East Coast September 26-28, forced the evacuation of over a million people in affected areas and caused damages estimated in the hundreds of millions of dollars. Both hurricanes caused small stream and coastal flooding but also ended, at least temporarily, persistently below-normal streamflows in central Florida and mainland New York.

Flood damages were estimated at \$10-\$12 million in the Flint, Michigan, area after up to 12 inches of rain fell in an 8-hour period September 8-9. Peak discharges on two streams in the area had recurrence intervals of 25 years.

Contents of 67 percent of reporting reservoirs were at or above average for the end of September, but the New York City reservoir system and many reservoirs in Texas, Oklahoma, Wyoming, Montana, Idaho, and Washington were below average.

STREAMFLOW CONDITIONS DURING SEPTEMBER 1985

Streamflow generally decreased in Hawaii, Alaska, southwestern Canada, North Dakota, Wyoming, Utah, Colorado, Illinois, Indiana, the Southeast, Quebec, and New Brunswick. Flows generally increased in the rest of the United States and Canada.

Below-normal streamflow persisted only in parts of British Columbia, Quebec, South Dakota, Wyoming, and New York. Monthly mean flows moved into the below-normal range in parts of Hawaii, California, Texas, Georgia, South Carolina, Virginia, West Virginia, Maine, New Brunswick, and Quebec.

Above-normal streamflow persisted in parts of Alaska, Colorado, Utah, South Dakota, Minnesota, Wisconsin, Ontario, Connecticut, the Carolinas, Tennessee, and Mississippi. Monthly mean flows moved into the above-normal range in parts of Hawaii, Alaska, Washington, Oregon, Idaho, Montana, British Columbia, Alberta, Saskatchewan, Manitoba, the Dakotas, Minnesota, Nebraska, Iowa, Wisconsin, Michigan, Indiana, Ohio, Maine, New Hampshire, Vermont, Rhode Island, New York, and adjacent States, Delaware, Maryland, Florida, Louisiana, Texas, New Mexico, Arizona, Utah, Colorado, and California. Both the monthly mean flow of 16,770 cubic feet per second (cfs) and the daily mean flow of 20,300 cfs on September 10 of the Mississippi River near Anoka, Minnesota (drainage area 19,600 square miles), were the highest of record (53 years) for September. The monthly mean flow of 4,891 cfs on the Red River of the North at Grand Forks, North Dakota (drainage area 30,100 square miles), was the highest for September in 103 years of record. The monthly mean flow of 652 cfs on the Little Susitna River near Palmer, Alaska (drainage area 61.9 square miles), was the highest for September in 37 years of record.

Hurricane Elena caused estimated damages in the hundreds of millions of dollars in its wake from Florida to Louisiana and forced over one million people to evacuate affected areas. Some areas reported flash flooding and

tornadoes but rainfall amounts in Mississippi, where Elena made landfall on September 3, were less than those originally predicted.

Flood damages estimated at \$10-\$12 million were caused by up to 12 inches of rain during an 8-hour period on September 8-9 in the Flint, Michigan, area. The peak discharges of 11,100 cfs for the Flint River near Flint (drainage area 956 square miles) and 1,460 cfs for Kearsley Creek near Davison (drainage area 99.4 square miles) both had recurrence intervals of about 25 years.

Hurricane Gloria caused coastal and small-stream flooding from North Carolina to New England September 26-28. Gloria moved up the coast quickly (35-40 mph) and far enough off the coast to mitigate some of her predicted effects, making landfall at low tide on Long Island, New York. Many coastal residents were evacuated with few injured and none killed.

The hurricanes brought at least temporary relief from persistently below-normal streamflow to both central Florida and mainland New York. Up to nine inches of rain fell in the Delaware River basin with the runoff from Gloria increasing the storage in New York City's Delaware River basin reservoir system by about 13 billion gallons. On September 30, the salt front (250 milligrams per liter of chloride) in the Delaware River was 25 miles downstream from its September 19 position on the south side of Philadelphia, Pennsylvania. Water-use restrictions were still in effect for the Delaware River basin.

Flood stages, as designated by the National Weather Service, were exceeded on many rivers and small streams in Alaska, California, Arizona, Colorado, the tier of States from Texas and Louisiana northward to Canada, in Wisconsin, Indiana, Kentucky, Florida, South Carolina, and also in coastal States from North Carolina to New England.

Contents of 67 percent of reporting reservoirs were at or above average for the end of September. Significant declines in storage occurred at 26 percent of the sites,

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but most of these were still at or above average. Belle Fourche (South Dakota), Lake Altus (Oklahoma), and Twin Buttes (Texas) reservoirs were all far below average for the end of September, standing at 7 percent, or less, of normal maximum. Contents of the New York City reservoir system and many reservoirs in Texas, Oklahoma, Wyoming, Montana, Idaho, and Washington were also below average.

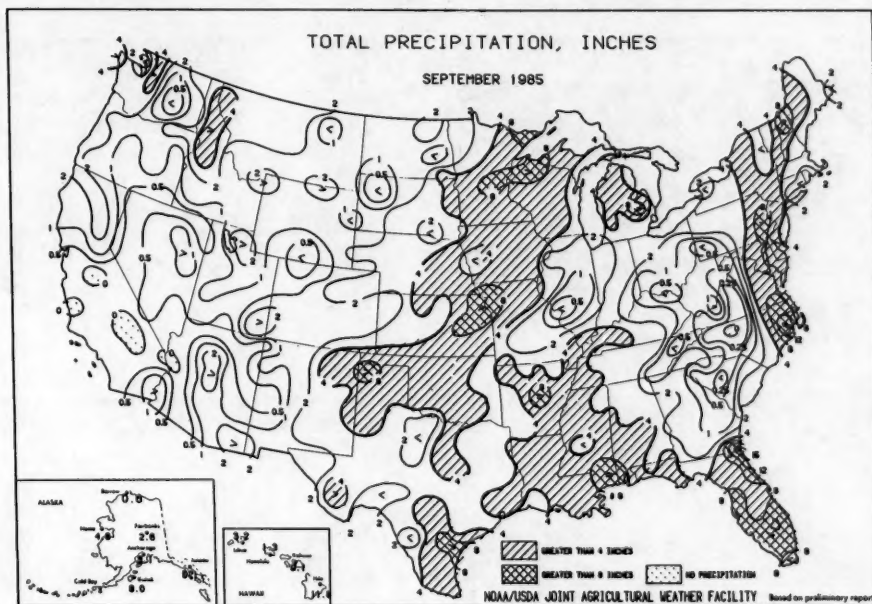
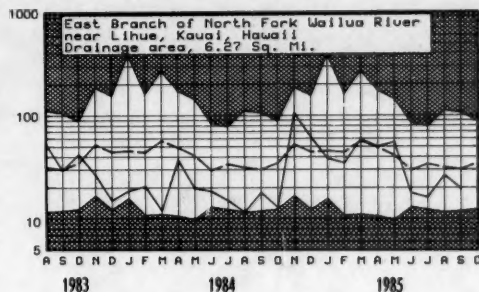
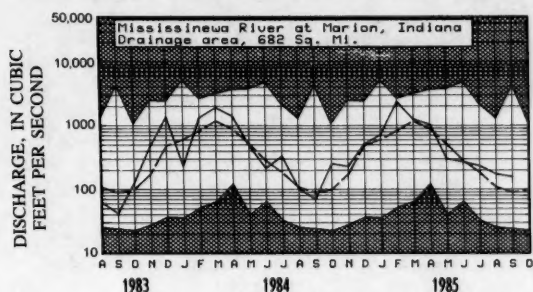
The combined flow of the three largest rivers in the lower 48 States—Mississippi, St. Lawrence, and Columbia—was 723,567 cfs during September, 1 percent

below last month but 13 percent above the long-term average. These three large river systems account for runoff from more than half the conterminous United States and provide a useful check on the status of the Nation's surface-water resources.

The hydrographs on page 3 illustrate well the variability of streamflow across the Nation and complement the maps for streamflow during fall-winter 1985 (page 10), spring-summer 1985 (page 10), and water year 1985 (page 11).

SURFACE WATER – MONTHLY MEAN DISCHARGE IN KEY STREAMS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period.



(From Weekly Weather and Crop Bulletin published by National Weather Service and Department of Agriculture.)

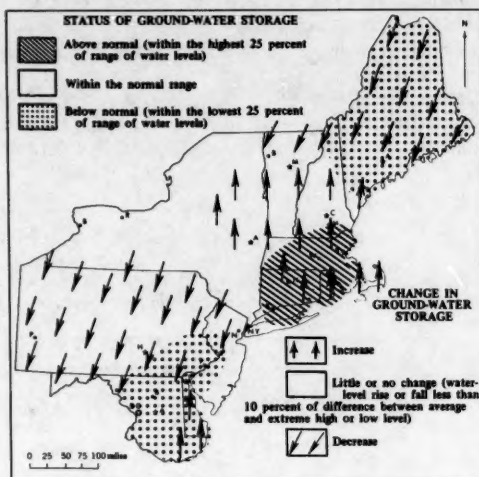
GROUND-WATER CONDITIONS DURING SEPTEMBER 1985

Ground-water levels began to rise seasonally in central New England and in Delaware and the Eastern Shore of Maryland. (See map.) The area of rising levels may be more extensive than shown on the map because of recharge very late in the month by rains associated with Hurricane Gloria. Levels near end of month remained above average in parts of central New England and may have become above average in southern New England at the end of September. Levels were generally below average in Maine and in parts of New Jersey, Delaware, and Maryland.

In the Southeast, ground-water levels declined in Kentucky and Mississippi; trends were mixed in other southeastern States. Water levels were above average in Kentucky, and below average in Arkansas and Florida. Levels were mixed with respect to average in West Virginia, Virginia, North Carolina, and Louisiana. A new low ground-water level for September was recorded in the key well in Memphis in western Tennessee, and several new September low levels were reported in the Jackson metropolitan area in Mississippi.

In the central and western Great Lakes States, ground-water levels declined in Wisconsin, Indiana, and Ohio. Trends were mixed in Minnesota, Michigan, and Iowa.

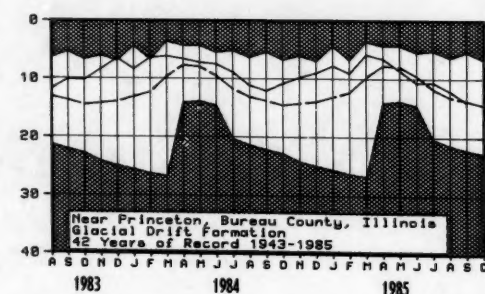
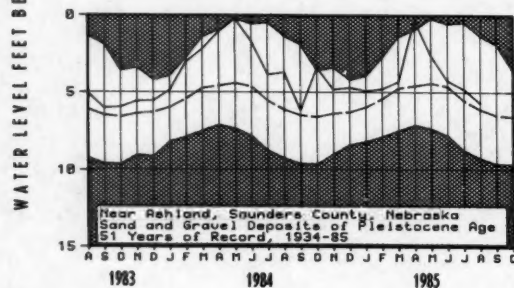
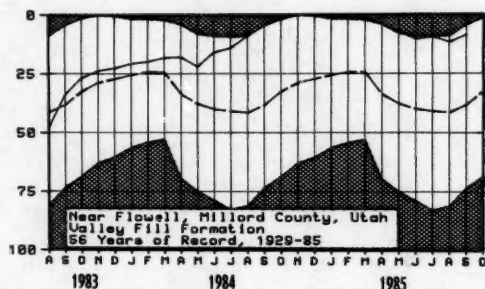
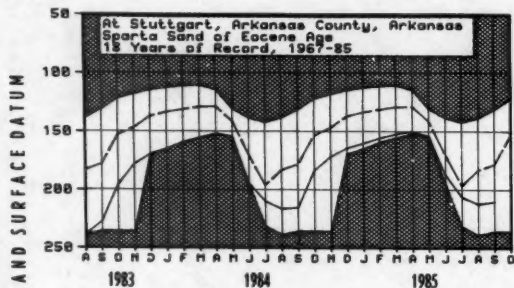
Water levels were generally above average in Wisconsin and Michigan, and near normal in Indiana. Levels were mixed with respect to average in Minnesota and Iowa.



Map shows ground-water storage near end of September and change in ground-water storage from end of August to end of September.

MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.



**WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN
THE CONTERMINOUS UNITED STATES—SEPTEMBER 1985**

Aquifer and location	Water level in feet with reference to land-surface datum	Departure from average in feet	Net change in water level in feet since:		Year records began	Remarks
			Last month	Last year		
Glacial drift at Hanska, south-central Minnesota	-5.37	+2.78	+0.88	+1.79	1942	
Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan	-3.90	+1.18	+0.71	+0.83	1935	
Glacial drift at Marion, Iowa	-8.72	-2.22	-0.70	-2.63	1941	
Glacial drift at Princeton in northwestern Illinois	-13.95	-0.20	-1.87	-2.83	1943	
Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia	-17.44	-1.33	-0.44	-0.84	1939	
Glacial outwash sand and gravel, Louisville, Kentucky (U.S. well no. 2)	-16.86	+8.41	-0.13	+0.08	1946	
500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2)	-104.86	-15.24	-0.18	-0.45	1941	September low.
Granite in eastern Piedmont Province, Chapel Hill, North Carolina (U.S. well no. 5)	-42.63	-0.10	-0.48	-4.59	1931	
Sparta Sand in Pine Bluff industrial area, Arkansas	-222.10	-14.24	-1.85	+9.00	1958	
Eutaw Formation in the City of Montgomery, Alabama (U.S. well no. 4)	-25.2	-1.5	-2.6	-4.8	1952	
Limestone aquifer on Cockspur Island, Savannah area, Georgia (U.S. well no. 6)	-34.05	+6.91	+0.25	+0.28	1956	
Sand and gravel in Puget Trough, Tacoma, Washington	-103.63	+4.39	+0.65	-1.35	1952	
Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3)	-458.8	-0.4	0.0	-5.3	1929	
Snake River Group: southwestern Snake River Plain aquifer, at Eden, Idaho	-118.2	-3.5	+1.2	+1.9	1957	
Alluvial valley fill in Flowell area, Millard County, Utah (U.S. well no. 9)	-8.62	+29.49	+3.03	-4.14	1929	
Alluvial sand and gravel, Platte River Valley, Ashland, Nebraska (U.S. well no. 6)	-6.20	+0.22	-0.50	-0.05	1935	
Alluvial valley fill in Steptoe Valley, Nevada	-8.91	+4.55	+0.37	+0.26	1950	September high.
Pleistocene terrace deposits in Kansas River valley, at Lawrence, north-eastern Kansas	-18.95	+2.08	-0.55	+1.71	1953	
Alluvium and Paso Robles clay, sand, and gravel, Santa Maria Valley, California	-112.73	+30.59	-2.06	-15.68	1957	
Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15)	-105.75	-24.27	+0.15	+2.25	1951	
Hueco bolson, El Paso area, Texas	-265.02	-16.17	+1.49	-1.30	1965	September low.
Evangelina aquifer, Houston area, Texas	-321.29	-17.02	-6.59	-5.07	1965	

In the West, ground-water levels rose in Washington and Utah; trends were mixed in other western States. Water levels were above average in Washington and Nebraska, and below average in North Dakota. Levels were mixed with respect to average in other western States. New high ground water levels for September were reached in Nevada and New Mexico, and new September

low levels were recorded in Nevada and Texas. A new alltime high level was reached in the key well in the Blanding area in southeastern Utah, in 25 years of record. An Alltime low level was reached in 41 years of record in the key well at Dayton, in Eddy County, New Mexico, in the southern part of the Roswell basin.

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF SEPTEMBER 1985

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

Principal uses: F—Flood control I—Irrigation M—Municipal P—Power R—Recreation W—Industrial	Percent of normal maximum				Normal maximum (acre-feet) ^a	Reservoir	Percent of normal maximum				Normal maximum (acre-feet) ^b	
	End of Sept. 1985	End of Sept. 1984	Average for end of Sept.	End of Aug. 1985			End of Sept. 1985	End of Sept. 1984	Average for end of Sept.	End of Aug. 1985		
NOVA SCOTIA						NEBRASKA						
Enol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	21	49	39	27	226,300	Lake McConaughy (IP)						1,948,000
QUEBEC						OKLAHOMA						
Allard (P)	76	76	62	77	280,600	Eufaula (FPR)						2,378,000
Gouin (P)	83	86	68	93	6,954,000	Keystone (FPR)						661,000
MAINE						Tenkiller Ferry (FPR)						628,000
Seven reservoir systems (MP)	52	57	58	61	4,098,000	Lake Altus (FIMR)						133,000
NEW HAMPSHIRE						Lake O'The Cherokees (FPR)						1,492,000
First Connecticut Lake (P)	75	78	78	85	76,450	OKLAHOMA—TEXAS						
Lake Francis (FPR)	78	59	77	74	99,310	Lake Texoma (FMPRW)						2,722,000
Lake Winnepesaukee (PR)	66	66	64	54	165,700	TEXAS						
VERMONT						Bridgeport (IMW)						386,400
Harriman (P)	80	70	64	78	116,200	Canyon (FMR)						385,600
Somerset (P)	68	70	71	64	57,390	International Amistad (FIMPW)						3,497,000
MASSACHUSETTS						International Falcon (FIMPW)						2,668,000
Cobble Mountain and Borden Brook (MP)	53	70	74	55	77,920	Livingston (IMW)						1,788,000
NEW YORK						Possum Kingdom (IMPRW)						570,200
Great Sacandaga Lake (FPR)	60	64	62	65	786,700	Red Bluff (PI)						307,000
Indian Lake (FMP)	79	77	60	83	103,300	Toledo Bend (P)						4,472,000
New York City reservoir system (MW)	49	72	76	49	1,680,000	Twin Buttes (FIM)						177,800
NEW JERSEY						Lake Kemp (IMW)						268,000
Wanaque (M)	78	81	68	79	85,100	Lake Meredith (FWM)						796,900
PENNSYLVANIA						Lake Travis (FIMPRW)						1,144,000
Allegheny (FPR)	38	43	41	42	1,180,000	MONTANA						
Pymatuning (FMR)	87	91	82	92	188,000	Canyon Ferry (FIMPR)						2,043,000
Raystown Lake (FR)	66	67	61	67	761,900	Fort Peck (FPR)						18,910,000
Lake Wallenpaupack (PR)	75	60	56	71	157,800	Hungry Horse (FIPR)						3,451,000
MARYLAND						WASHINGTON						
Baltimore municipal system (M)	75	96	86	80	261,900	Ross (PR)						1,052,000
NORTH CAROLINA						Franklin D. Roosevelt Lake (IP)						5,022,000
Bridgewater (Lake James) (P)	92	91	84	97	288,800	Lake Chelan (PR)						676,100
Narrows (Badin Lake) (P)	89	92	97	99	128,900	Lake Cushman (PR)						359,500
High Rock Lake (P)	67	55	64	95	234,800	Lake Merwin (P)						245,600
SOUTH CAROLINA						IDAHO						
Lake Murray (P)	84	82	68	96	1,614,000	Boise River (4 reservoirs) (FIP)						1,235,000
Lakes Marion and Moultrie (P)	76	78	68	86	1,862,000	Coeur d'Alene Lake (P)						238,500
SOUTH CAROLINA—GEORGIA						Pend Oreille Lake (FP)						1,561,000
Clark Hill (FP)	66	67	58	70	1,730,000	IDAHO—WYOMING						
GEORGIA						Upper Snake River (8 reservoirs) (MP)						4,401,000
Burton (PR)	97	95	80	98	104,000	WYOMING						
Sinclair (MPR)	88	86	82	92	214,000	Boysen (FIP)						802,000
Lake Sidney Lanier (FMPR)	54	59	54	59	1,686,000	Buffalo Bill (IP)						421,300
ALABAMA						Keyhole (F)						193,800
Lake Martin (P)	90	88	77	93	1,375,000	Pathfinder, Seminole, Alcovia, Kortas, Glendo, and Guernsey Reservoirs (I)						3,056,000
TENNESSEE VALLEY						COLORADO						
Clinch Projects: Norris and Melton Hill Lakes (FPR)	34	39	38	43	2,229,300	John Martin (FIR)						364,400
Douglas Lake (FPR)	27	34	33	39	1,394,000	Taylor Park (IR)						106,200
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parkville Lakes (FPR)	57	67	59	65	1,012,000	Colorado—Big Thompson project (I)						730,300
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	45	52	46	51	2,880,000	COLORADO RIVER STORAGE PROJECT						
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	43	58	57	52	1,478,000	Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR)						31,620,000
WISCONSIN						UTAH—IDAHO						
Chippewa and Flambeau (PR)	86	86	74	86	365,000	Bear Lake (IPR)						1,421,000
Wisconsin River (21 reservoirs) (FR)	90	62	63	76	399,000	CALIFORNIA						
MINNESOTA						Folsom (FIP)						1,000,000
Mississippi River headwater system (FMR)	35	28	32	38	1,640,000	Hetch Hetchy (MP)						360,400
NORTH DAKOTA						Isabella (FIR)						568,100
Lake Sakakawea (Garrison) (FIPR)	82	92	91	79	22,700,000	Pine Flat (FI)						1,001,000
SOUTH DAKOTA						Clair Engle Lake (Lewiston) (P)						2,438,000
Angostura (I)	46	67	73	49	127,600	Lake Almanor (P)						1,036,000
Belle Fourche (I)	6	37	32	10	185,200	Lake Berryessa (FIMW)						1,600,000
Lake Francis Case (FIP)	74	75	69	78	4,834,000	Millerton Lake (FI)						503,200
Lake Oahe (FIP)	77	89	79	79	22,530,000	Shasta Lake (FIPR)						4,377,000
Lake Sharpe (FIP)	101	102	100	99	1,725,000	CALIFORNIA—NEVADA						
Lewis and Clarke Lake (FIP)	95	93	97	92	477,000	Lake Tahoe (IPR)						744,600
						NEVADA						
						Rye Patch (I)						194,300
						ARIZONA—NEVADA						
						Lake Mead and Lake Mohave (FIMP)						27,970,000
						ARIZONA						
						San Carlos (IP)						935,100
						Salt and Verde River system (IMPR)						2,019,100
						NEW MEXICO						
						Conchas (FIR)						330,100
						Elephant Butte and Caballo (FIPR)						2,453,000

^a 1 acre-foot = 0.0436 million cubic feet = 0.326 million gallons = 0.504 cubic foot per second day.^b Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

FLOW OF LARGE RIVERS DURING SEPTEMBER 1985

Station number	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1980 (cubic feet per second)	September 1985					
				Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge, 1951-80	Change in discharge from previous month (percent)	Discharge near end of month		
							Cubic feet per second	Million gallons per day	Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,690	9,647	1,800	38	-53	4,740	3,063	30
01318500	Hudson River at Hadley, N.Y.	1,664	2,909	2,260	207	+484	4,500	2,910	30
01357500	Mohawk River at Cohoes, N.Y.	3,456	5,734	2,090	120	+156	6,500	4,200	30
01463500	Delaware River at Trenton, N.J.	6,780	11,750	9,395	220	+167	39,100	25,270	30
01570500	Susquehanna River at Harrisburg, Pa.	24,100	34,530	8,310	113	+27	44,900	29,020	29
01646500	Potomac River near Washington, D.C.	11,560	¹ 11,490	2,410	88	-31	3,000	1,900	30
02105500	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	5,005	1,600	89	-78	1,000	600	30
02131000	Pee Dee River at Peedee, S.C.	8,830	9,851	7,830	153	-44	6,130	3,961	26
02226000	Altamaha River at Doctortown, Ga.	13,600	13,880	6,245	126	+1	2,420	1,564	29
02320500	Suwannee River at Branford, Fla.	7,880	6,987	8,890	177	+78	7,260	4,692	30
02358000	Apalachicola River at Chattahoochee, Fla.	17,200	22,570	12,300	104	-10	10,900	7,040	30
02467000	Tombigbee River at Demopolis lock and dam near Coatopa, Ala.	15,400	23,300	4,156	108	-64	2,100	1,360	30
02489500	Pearl River near Bogalusa, La.	6,630	9,768	3,629	160	-28	3,220	2,081	30
03049500	Allegheny River at Natrona, Pa.	11,410	¹ 19,480	5,988	149	+11	5,780	3,735	26
03085000	Monongahela River at Braddock, Pa.	7,337	¹ 12,510	2,818	88	-37	2,150	1,389	26
03193000	Kanawha River at Kanawha Falls, W. Va.	8,367	12,590	2,636	78	-54	2,310	1,492	23
03234500	Scioto River at Higby, Ohio	5,131	4,547	595	57	-38	495	319	30
03294500	Ohio River at Louisville, Ky. ²	91,170	116,000	21,320	92	-33	21,120	13,650	22
03377500	Wabash River at Mount Carmel, Ill.	28,635	27,220	6,945	102	-50	5,600	3,620	30
03469000	French Broad River below Douglas Dam, Tenn.	4,543	6,798	2,169	77	-60	.....	.....	...
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wis. ³	6,150	4,163	4,231	198	+43	4,519	2,920	30
04264331	St. Lawrence River at Cornwall, Ontario—near Massena, N.Y. ⁴	299,000	242,700	295,300	114	+0	293,000	189,400	30
02NG001	St. Maurice River at Grand Mere, Quebec	16,300	25,150	6,390	34	-57	18,610	12,030	30
05082500	Red River of the North at Grand Forks, N. Dak.	30,100	2,551	4,891	398	-28	5,260	3,400	24
05133500	Rainy River at Manitou Rapids, Minn.	19,400	12,830	15,000	143	-17	23,300	15,060	24
05330000	Minnesota River near Jordan, Minn.	16,200	3,402	5,698	600	+274	4,900	3,170	30
05331000	Mississippi River at St. Paul, Minn.	36,800	¹ 10,610	23,530	377	+75	22,000	14,200	30
05365500	Chippewa River at Chippewa Falls, Wis.	5,600	5,100	9,153	286	+130	12,000	7,800	30
05407000	Wisconsin River at Muscoda, Wis.	10,300	8,617	9,875	169	+57	14,240	9,203	27
05446500	Rock River near Joslin, Ill.	9,551	5,873	3,150	107	-4	4,240	2,740	30
05474500	Mississippi River at Keokuk, Iowa	119,000	62,620	62,380	144	+42	70,200	45,370	30
06214500	Yellowstone River at Billings, Mont.	11,796	7,038	3,800	85	-16	4,450	2,876	30
06934500	Missouri River at Hermann, Mo.	524,200	79,490	69,520	129	-15	100,000	60,000	27
07289000	Mississippi River at Vicksburg, Miss. ⁴	1,140,500	576,600	331,100	118	-3	259,000	167,400	26
07331000	Washita River near Dickson, Okla.	7,202	1,368	443	114	+23	1,030	665	24
08276500	Rio Grande below Taos Junction Bridge, near Taos, N. Mex.	9,730	725	350	138	-36	471	304	30
09315000	Green River at Green River, Utah.	40,600	6,298	3,400	123	-14	.....	.....	...
11425500	Sacramento River at Verona, Calif.	21,257	18,820	9,726	80	-13	7,300	4,720	26
13269000	Snake River at Weiser, Idaho	69,200	18,050	16,930	127	+45	16,040	10,370	29
13317000	Salmon River at White Bird, Idaho	13,550	11,250	5,600	121	+33	5,040	3,257	29
13342500	Clearwater River at Spalding, Idaho	9,570	15,480	6,022	195	+80	4,570	2,953	29
14105700	Columbia River at The Dalles, Oreg. ^{1,5}	237,000	193,100	97,200	101	+4	89,100	57,590	29
14191000	Willamette River at Salem, Oreg.	7,280	23,510	4,160	104	+19	11,100	7,170	29
15515500	Tanana River at Nenana, Alaska.	25,600	23,460	42,370	135	-28	22,000	14,200	30
08MF005	Fraser River at Hope, British Columbia	83,800	96,290	68,860	81	-30	66,030	42,680	30

¹ Adjusted.² Records furnished by Corps of Engineers.³ Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.⁴ Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.⁵ Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

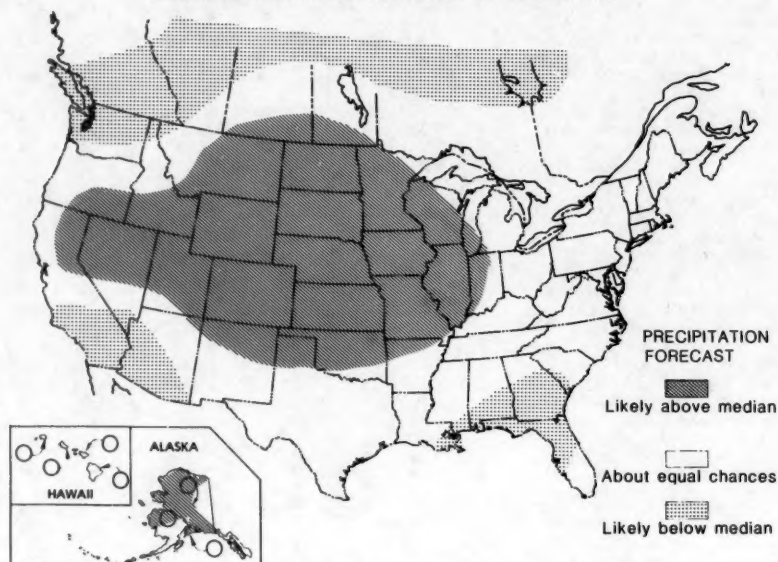
Provisional data; subject to revision

**DISSOLVED SOLIDS AND WATER TEMPERATURES, SEPTEMBER 1985, AT DOWNSTREAM SITES
ON SIX LARGE RIVERS**

Station number	Station name	September data of following calendar years	Stream discharge during month	Dissolved-solids concentration ^a		Dissolved-solids discharge ^a			Water temperature ^b		
			Mean (cfs)	Mini- mum (mg/L)	Maxi- mum (mg/L)	Mean	Mini- mum	Maxi- mum	Mean, in °C	Mini- mum, in °C	Maxi- mum, in °C
						(tons per day)					
01463500	Delaware River at Trenton, N.J. (Morrisville, Pa.)	1985 1945-84 (Extreme yr)	9,390 5,390 c4,272	64 63 (1977)	143 149 (1965)	2,130	534 523 (1966)	13,400 6,700 (1974)	23.0 ...	16.0 14.0	28.0 32.0
04264331	St. Lawrence River at Cornwall, Ontario, near Massena, N.Y. (median streamflow at Ogdensburg, N.Y.)	1985 1975-84 (Extreme yr)	296,000 287,000 c259,400	165 164 (1980)	166 175 (1979)	132,200 128,600	129,000 119,000 (1982)	133,900 142,000 (1976)	19.0 19.0	18.0 15.0	20.0 22.5
07289000	Mississippi River at Vicksburg, Miss.	1985 1975-84 (Extreme yr)	330,000 354,500 c281,700	244 185 (1977)	289 300 (1984)	232,000 238,100	195,000 116,000 (1976)	297,000 472,000 (1979)	25.0 26.0	21.5 21.0	27.5 30.0
03612500	Ohio River at lock and dam 53, near Grand Chain, Ill. (streamflow station at Metropolis, Ill.)	1985 1955-84 (Extreme yr)	54,650 113,900 c89,720	123 117 (1965)	185 314 (1965)	..... .....	13,100 9,190 (1961)	66,300 304,000 (1975)	... ...	25.5 17.0	27.0 30.0
06934500	Missouri River at Hermann, Mo. (60 miles west of St. Louis, Mo.)	1985 1975-84 (Extreme yr)	71,100 74,870 c54,090	351 204 (1977)	493 525 (1983)	82,000 77,630	60,600 46,900 (1976)	115,000 158,000 (1982)	22.0 23.0	16.0 17.0	27.5 28.5
14128910	Columbia River at Warrendale, Oreg. (streamflow station at The Dalles, Oreg.)	1985 1975-84 (Extreme yr)	103,000 117,800 c96,870	90 73 (1976)	97 102 (1977, 1979)	26,000 29,000	20,700 16,800 (1981)	34,700 50,300 (1976)	18.0 19.0	17.0 12.0	20.0 22.5

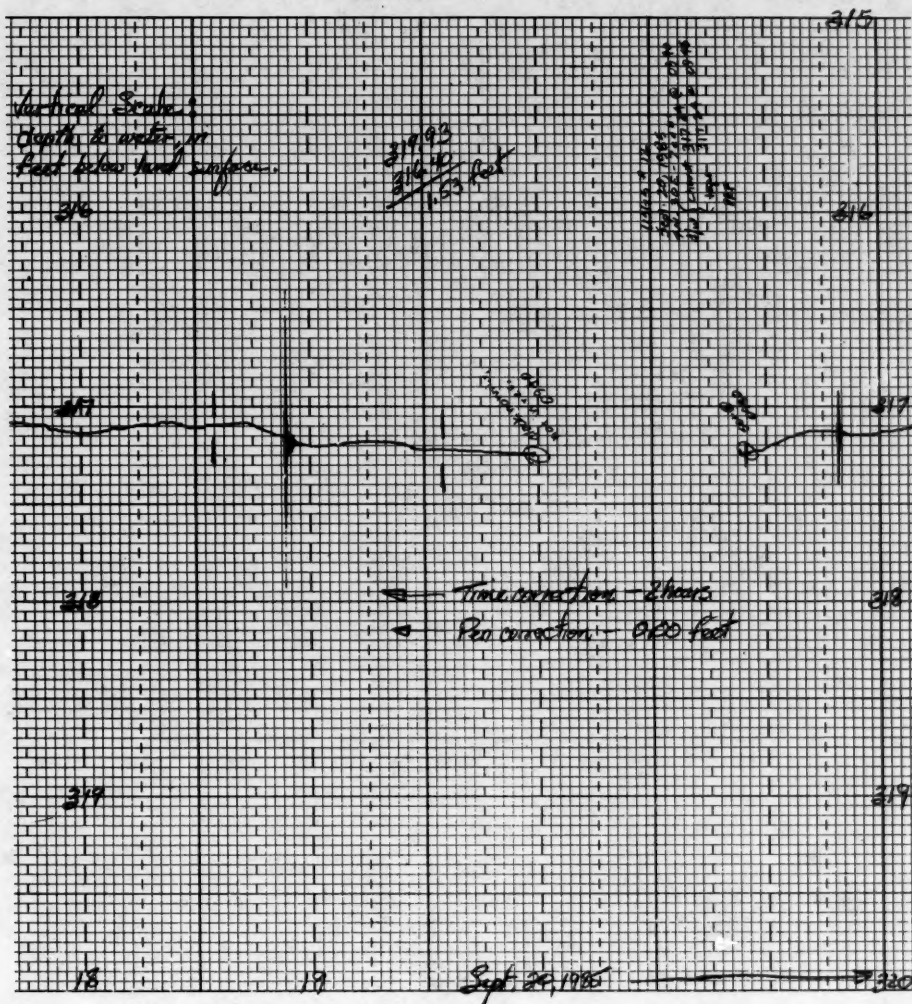
^aDissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.^bTo convert °C to °F: $[(1.8 \times ^\circ\text{C}) + 32] = ^\circ\text{F}$.^cMedian of monthly values for 30-year reference period, water years 1951-80, for comparison with data for current month.

PRECIPITATION FORECAST FOR OCTOBER 1985



(From Monthly and Seasonal Weather Outlook Published by National Weather Service)

MEXICAN EARTHQUAKE RECORDED IN BUTTE COUNTY, IDAHO, WELL

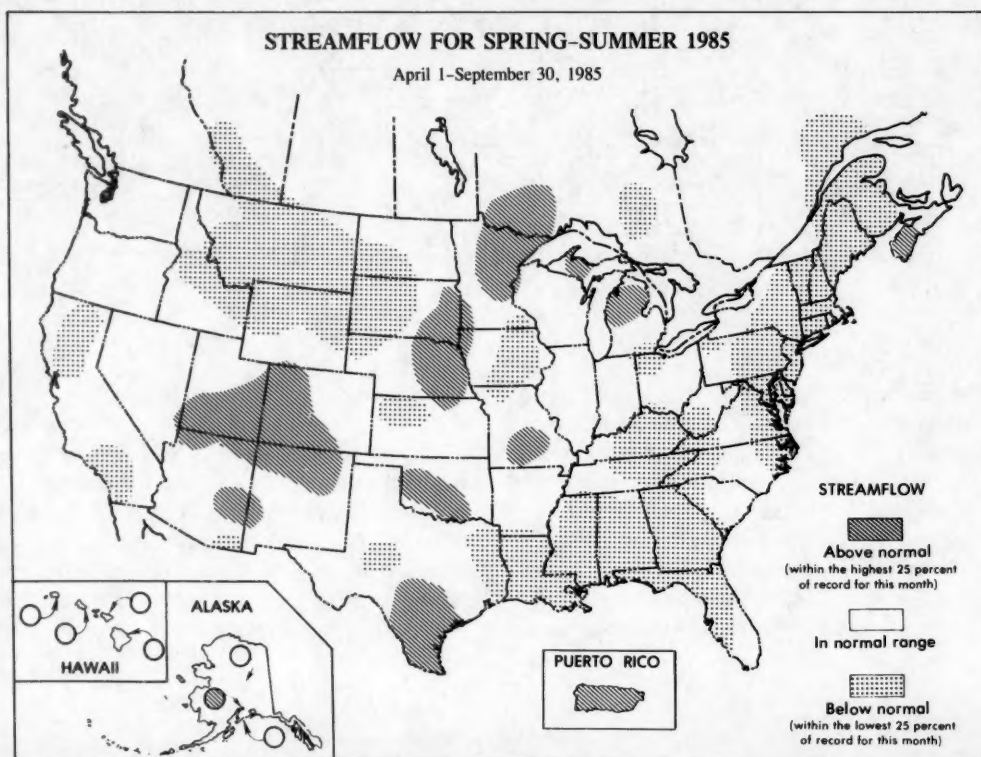
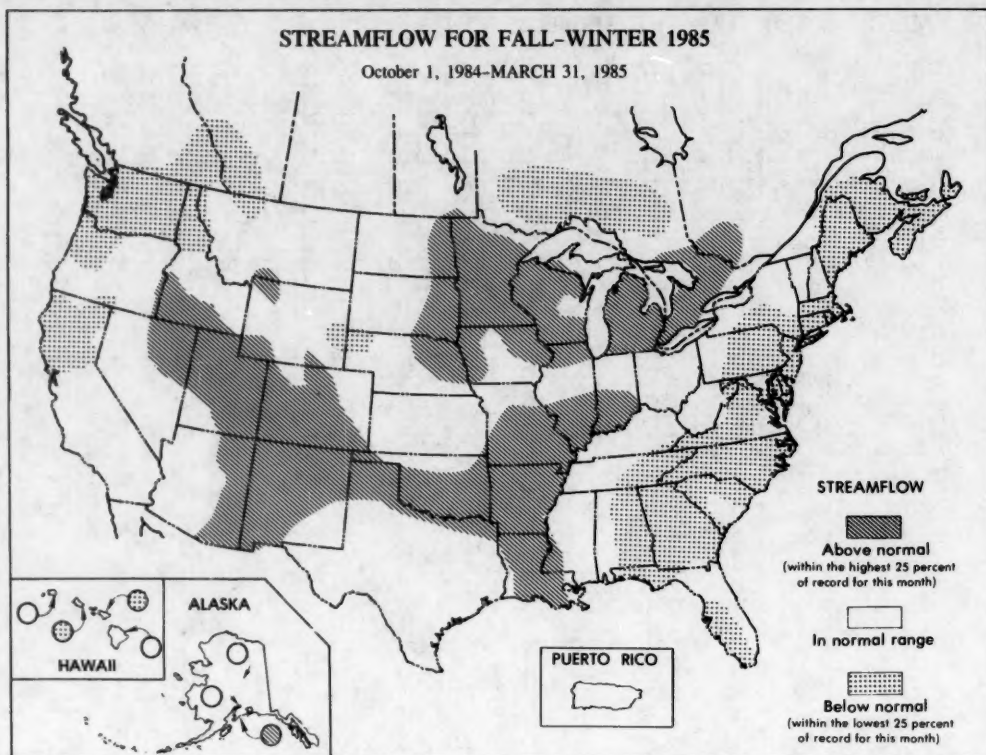


The segment of recorder strip chart reproduced above is from a U.S. Geological Survey observation well 434126112550701 in Butte County, Idaho, about 1,700 miles north-northwest of Mexico City, Mexico. The pen trace shows water level fluctuations of 1.53 feet caused by the magnitude 8.1 earthquake which occurred at 7:17:48 a.m. Mountain Daylight Time (MDT) on September 19, 1985 and 0.48 foot caused by the magnitude 7.5 aftershock

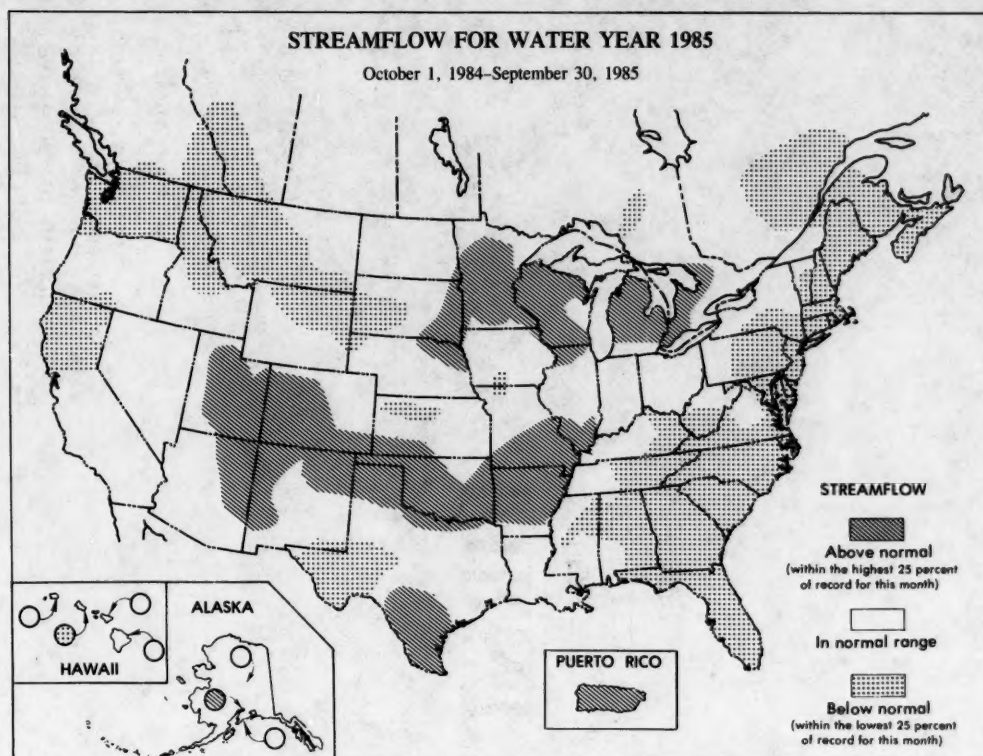
which occurred at 7:37 p.m. MDT on September 20, 1985.

This well is cased into the Snake River Group Basalt and was originally drilled to a depth of 692 feet but caved to a depth of 563 feet. Land surface datum is 4,820.5 feet National Geodetic Vertical Datum and the chart shows depth to water from the land surface. (Chart sent in by Larry J. Mann, Idaho Falls, Idaho, Project Office).

SUPPLEMENTAL DATA FOR WATER YEAR 1985



SUPPLEMENTAL DATA FOR WATER YEAR 1985



NATIONAL WATER CONDITIONS

September 1985

Based on reports from the Canadian and U.S. Field offices; completed October 11, 1985

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EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for the month based on 18 index stream-gaging stations in Canada and 164 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the point shown by the arrows.

Streamflow for the current month is compared with the flow for the same month in the 30-year reference period, 1951–80. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile). Shorter

reference periods are used for the Puerto Rico index stations because of the limited records available.

Flow higher than the lower quartile but lower than the upper quartile is described as being *within the normal range*. In the National Water Conditions, the median is obtained by ranking the 30 flows of each monthly of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median. One-half of the time you would expect the flows for the month to be below the median and one-half of the time to be above the median.

Flood frequency analyses define the relation of flood peak magnitude to probability of occurrence or recurrence interval. Probability of occurrence is the chance that a given flood magnitude will be exceeded in any one year. Recurrence interval is the reciprocal of probability of occurrence and is the *average* number of years between occurrences. For example, a flood having a probability of occurrence of 0.01 (1 percent) has a recurrence interval of 100 years. Recurrence intervals imply no regularity of occurrence; a 100-year flood might be exceeded in consecutive years or it might not be exceeded in a 100-year period.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the entire past record for that well or from a 30-year reference period, 1951–80. *Changes in ground-water levels*, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data for September are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). Dissolved solids are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. Dissolved-solids discharge represents the total daily amount of dissolved minerals carried by the stream. Dissolved-solids *concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at time of low flow.

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